



# Relationship between Fertility Knowledge, General Health Literacy, and Reproductive Health Literacy among Iranian Medical Students



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## ABSTRACT

**Aims** This study aimed to examine the association between fertility knowledge, general health literacy, and reproductive health literacy among female students at Saveh University of Medical Sciences.

**Instrument & Methods** This descriptive-analytical cross-sectional study was conducted in 2025 on 208 female medical sciences students. Data collection tools included the Cardiff Fertility Knowledge Scale, the Short Form Health Literacy for Iranian Adults, and the Women's Reproductive Health Literacy Questionnaire. Data were analyzed using SPSS 24. For inferential analysis, Spearman's correlation and backward linear regression were employed.

**Findings** The mean age of participants was 22.34±3.27 years. The mean fertility knowledge score was 7.68 out of 13, while the mean scores for general health literacy and reproductive health literacy were 74.07 and 73.54 out of 100, respectively. A significant positive correlation was observed between fertility knowledge and both general health literacy ( $r=0.401$ ;  $p<0.001$ ) and reproductive health literacy ( $r=0.386$ ;  $p<0.001$ ). Regression analysis revealed that general health literacy ( $p=0.003$ ) and reproductive health literacy ( $p=0.007$ ) were significant positive predictors of fertility knowledge.

**Conclusion** Fertility knowledge among female university students is moderate and influenced by both general and reproductive health literacy.

**Keywords** Fertility; Health Literacy; Reproductive Health; Students; Iran

## CITATION LINKS

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## Introduction

Fertility knowledge is recognized as a key component in promoting sexual and reproductive health [1]. It refers to an individual's awareness regarding the reproductive system, pregnancy, contraceptive methods, and risks associated with unintended pregnancies [2]. Those with adequate fertility knowledge are more capable of making informed decisions concerning their sexual and reproductive health [3] and are consequently less exposed to adverse outcomes such as unplanned pregnancies and sexually transmitted infections [4]. Studies have shown that insufficient knowledge of the menstrual cycle, conception, and preventive methods, particularly among adolescents and young adults, can lead to high-risk sexual behaviors and early pregnancies [5, 6].

General health literacy is a fundamental concept referring to an individual's ability to access, understand, evaluate, and apply health-related information across various domains, including prevention, treatment, and health promotion [7]. Beyond mere knowledge acquisition, health literacy emphasizes empowering individuals to make informed decisions regarding their personal health [8]. Health literacy is commonly categorized into three dimensions: functional, interactive, and critical. Functional health literacy includes the basic reading and comprehension skills necessary to understand health information in daily life [9]. Interactive health literacy involves communication skills and the ability to use information effectively in various social contexts. Critical health literacy refers to advanced cognitive skills needed to analyze and evaluate health information and make informed decisions to better control one's life circumstances [9-11]. Numerous studies have linked low health literacy with unfavorable health outcomes, including reduced use of healthcare services, higher prevalence of chronic diseases, increased hospitalization rates, unhealthy dietary patterns, obesity, engagement in risky behaviors, and a higher incidence of medication errors [12-14].

Reproductive health literacy, a specialized subset of health literacy, focuses on individuals' ability to understand and use information related to sexual and reproductive health [15]. Contrary to common perception, reproductive health literacy encompasses more than basic knowledge, such as naming contraceptive methods. It includes skills in evaluating information sources, critical thinking, and making informed decisions regarding sexual and reproductive health [16]. A growing body of evidence indicates that low levels of sexual and reproductive health literacy among adolescents and young adults are associated with outcomes such as high-risk sexual behavior [17], unintended pregnancies [18], unsafe abortions [2], higher rates of sexually transmitted infections, and substance misuse [19].

Globally, studies indicate that despite its importance, sexual and reproductive health literacy remains inadequate or moderate in many countries. For example, in low-income African and Asian countries, adolescent and youth sexual health literacy levels have been found to be particularly low, contributing to high-risk sexual behaviors [4]. In Asia, the sexual health literacy of adolescents and youth is frequently reported as low, largely due to limited access to educational resources and cultural taboos [4, 20]. In Sri Lanka, 47.4% of adolescents have limited sexual health literacy, and over half scored poorly in health promotion skills [21]. Similarly, in Thailand, the average sexual health literacy among girls aged 15-19 is moderate, but access to information and services receives the lowest score (54.72%) [22].

In Iran, recent studies have reported mixed results. In a study conducted in Kerman, the mean sexual health literacy score among couples is 68.76 out of 100; however, factors such as feelings of shame and the ability to differentiate reliable information sources are influential [23].

Another study in Qazvin province among women attending healthcare centers reports a mean score of  $76.90 \pm 18.32$ , with approximately 50% of participants demonstrating adequate literacy and 32% demonstrating excellent literacy [24]. In rural areas of southern Iran, about 82.5% of women exhibit a favorable level of sexual health literacy, although improvements are needed in access and analytical skills [25].

Given that youth is a critical and formative stage in life for developing sustainable health behaviors, enhancing health literacy, particularly in the domain of sexual and reproductive health, can have long-term implications for both individual and public health. Despite several studies that independently examine fertility knowledge, general health literacy, or reproductive health literacy, there remains a lack of research integrating these three components among youth populations. Accordingly, the present study aimed to investigate the relationship between fertility knowledge, general health literacy, and reproductive health literacy among young people.

## Instrument and Methods

### Design and sample

This descriptive-analytical cross-sectional study was conducted among female students at Saveh University of Medical Sciences in 2025. The study population consisted of 208 married female students aged 18 to 35 years who were currently enrolled at Saveh University of Medical Sciences.

The required sample size was calculated using the following formula:

$$n = \left( \frac{Z_{1-\alpha/2} + Z_{1-\beta}}{\frac{1}{2} \ln \left( \frac{1+\rho}{1-\rho} \right)} \right)^2 + 3$$

Given the limited number of previous studies in Iran on the association between fertility knowledge and both general and reproductive health literacy, the expected correlation coefficient ( $\rho$ ) was set at 0.20. A type I error ( $\alpha$ ) of 0.05 and statistical power ( $1-\beta$ ) of 0.80 were assumed. Based on these parameters, the required sample size was estimated at 193 participants. To account for potential attrition, 208 students were ultimately enrolled in the study.

#### Procedure

Participants were selected using a stratified sampling method based on academic departments. First, the number of female students in each department was determined, and then the required number of students was randomly selected from the attendance lists. Data collection was conducted from April to June 2025. All ethical principles of research were strictly adhered to, including providing participants with complete information about the study's objectives, methods, and rationale; ensuring confidentiality of the collected data; and obtaining written informed consent from all participants.

#### Instrument

**Demographic Questionnaire:** collected participants' demographic information, including age, occupation, economic status, history of chronic illness, smoking status, and other relevant characteristics.

**Short-Form Health Literacy for Iranian Adults (HELIA-SF):** was developed and psychometrically validated in 2022 by Tavousi *et al.* [26], demonstrating validity and reliability coefficients of 0.91 and 0.81, respectively. The questionnaire consists of 9 items assessing both basic and decision-making skills in the target population. These items measure five dimensions of health literacy: access, reading, comprehension, evaluation, and decision-making/behavior. Items 1 to 5 use a 5-point Likert scale ranging from 1="Very difficult" to 5="Very easy". Items 6 to 9 are rated on a 5-point Likert scale ranging from 1="Never" to 5="Always". We found its internal consistency to be 0.9, assessed using Cronbach's alpha.

**Reproductive Health Literacy Questionnaire:** developed by Kawata *et al.* in 2014 to assess women's reproductive health literacy. The instrument has demonstrated satisfactory reliability, with a Cronbach's alpha of 0.80 and a correlation coefficient of 0.71. It includes 21 items rated on a 4-point Likert scale ranging from 1="Not true at all" to 4="Completely true". The total score ranges from 21 to 84, with higher scores indicating higher reproductive health literacy [27]. An internal consistency of 0.94 was assessed for this scale.

**Cardiff Fertility Knowledge Scale (CFKS):** The CFKS, validated in Iran by Mirghafourvand *et al.* [28] in 2024 [28, 29], consists of 13 items evaluating fertility knowledge across three domains: a) factors contributing to reduced fertility, b) misconceptions about fertility, and c) basic facts regarding infertility.

Items are rated using a 3-point scale (true, false, don't know). Correct answers are scored as 1, while incorrect or "Don't know" responses receive a score of 0. Total scores are summed, divided by the number of items, and multiplied by 100. The original version reported a Cronbach's alpha of 0.79, while the Persian version demonstrated internal consistency and validity coefficients of 0.85 and 0.95, respectively. We found an internal consistency of 0.66 for this scale, assessed using Cronbach's alpha.

#### Data analysis

Data were analyzed using SPSS 24. Due to non-normal data distribution, assessed using the Kolmogorov-Smirnov test, Spearman's correlation coefficient was employed to examine associations between parameters. Linear regression analysis was also performed to evaluate predictive relationships.

### Findings

The mean age of the participants was  $22.34 \pm 3.27$  years. Among the 208 students, fewer than 5% reported smoking. Twelve participants had a history of chronic illness, and 30% reported engaging in regular physical activity (Table 1).

**Table 1.** Demographic characteristics of participants

Parameter	Category	Frequency (%)
<b>Occupation</b>	No	158 (76)
	Yes	50 (24)
<b>Economic status</b>	Income less than expenses	86 (41.3)
	Income equal to expenses	109 (52.4)
	Income greater than expenses	13 (6.3)
<b>Health self-assessment</b>	Good	102 (49)
	Moderate	105 (50.5)
	Bad	1 (0.5)
<b>Chronic disease</b>	No	196 (94.2)
	Yes	12 (5.8)
<b>Physical activity</b>	Never	38 (18.3)
	Moderate	107 (51.4)
	Regularly	63 (30.3)
<b>Smoking</b>	Never	198 (95.2)
	Former	7 (3.4)
	Current	3 (1.4)

More than 61% of participants had not attended any educational sessions on fertility knowledge and lacked the necessary information in this area. Consequently, the majority (122 individuals) expressed a need for education on fertility-related topics and showed a willingness to learn more in this field.

Among the various sources of fertility knowledge, healthcare professionals were identified as the primary source, followed by social media platforms, which also played a significant role (Table 2).

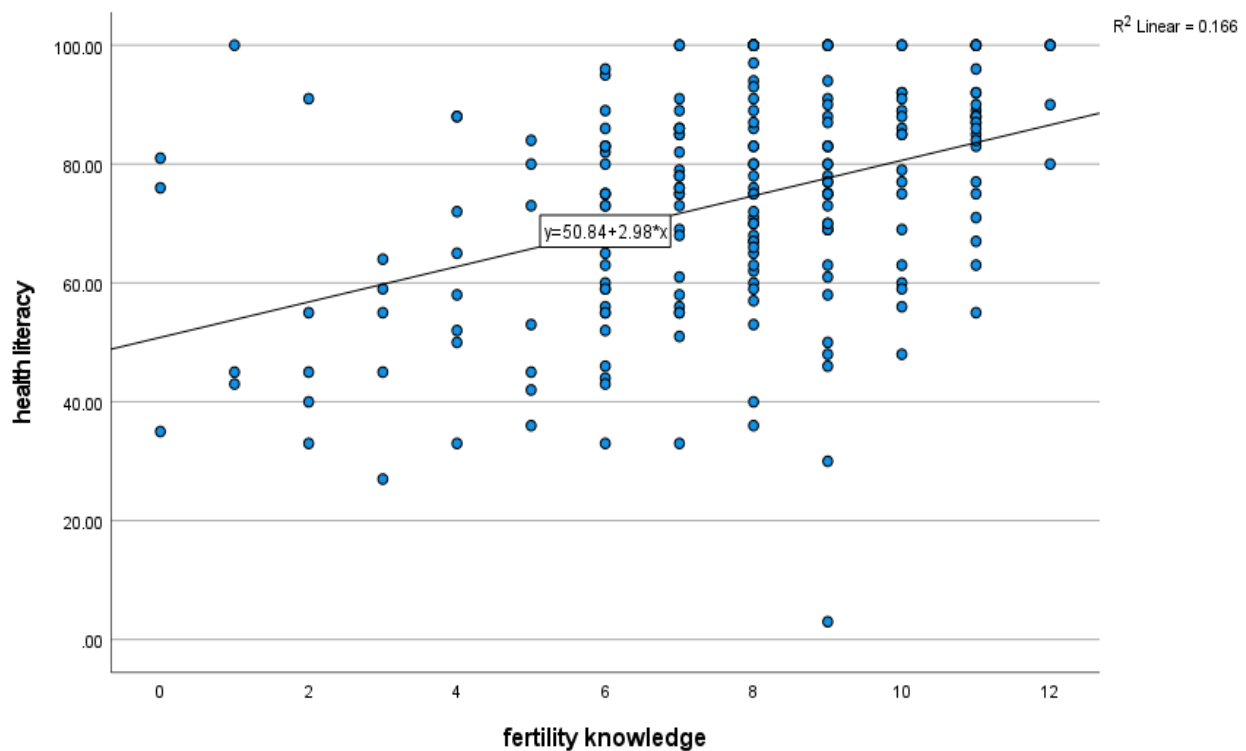
The mean fertility knowledge score (13 items) among participants was  $7.68 \pm 2.56$ , with scores ranging from 0 to 12. The mean general health literacy score (9 items) was  $74.07 \pm 18.76$  (range: 3.13-100). Additionally, the mean reproductive health literacy score (21 items) was  $73.54 \pm 9.91$ , with observed values ranging from 39 to 84.

**Table 2.** Participants' fertility knowledge, learning preferences, and information sources

Parameter	Category	Frequency (%)
Feeling the need for fertility knowledge	No	86 (41.3)
	Yes	122 (58.7)
Participating in reproductive health classes	No	128 (61.5)
	Yes	80 (38.5)
Desire to learn about reproductive health topics	No	72 (34.6)
	Yes	136 (65.4)
Using sexual and reproductive health services	No	165 (79.3)
	Yes	43 (20.7)
Ways to gain fertility knowledge	Social media	77 (37)
	Television	13 (6.3)
	Healthcare professionals	84 (40.4)
	Books, magazines	16 (7.7)
	Friends	13 (6.3)
	Parents	5 (2.3)

Spearman correlation analysis revealed a significant positive correlation between fertility knowledge and general health literacy ( $p < 0.001$ ). Similarly, fertility

knowledge was positively and significantly correlated with reproductive health literacy (correlation coefficient = 0.386,  $p < 0.001$ ). Moreover, a strong and significant positive correlation was observed between general health literacy and reproductive health literacy (Figure 1 and Table 3). The results of the linear regression analysis using the backward elimination method indicated that both general health literacy and reproductive health literacy were significant positive predictors of fertility knowledge scores. Specifically, general health literacy was positively and significantly associated with fertility knowledge ( $p = 0.003$ ), and reproductive health literacy was also positively associated with fertility knowledge ( $p = 0.007$ ). Additionally, economic status was significantly and negatively associated with fertility knowledge ( $p = 0.045$ ). Although age was positively associated with fertility knowledge, this relationship was borderline statistically significant ( $p = 0.058$ ; Table 4).



**Figure 1.** Scatter plots illustrating the correlations between fertility knowledge, general health literacy, and reproductive health literacy among participants

**Table 3.** Correlation between fertility knowledge, general health literacy, and reproductive health literacy (all cases  $p < 0.001$ )

Parameter	3	2	1
1- Fertility knowledge	0.685	0.401	1
2- Health literacy	0.386	1	
3- Reproductive health literacy	1		

**Table 4.** Linear regression analysis of fertility knowledge

Parameter	Unstandardized B	Standard error	Standardized B	p-Value	95% Confidence interval	
					Lower	Upper
Age	0.095	0.050	0.121	0.058	-0.003	0.193
Economic status	-0.541	0.269	-0.125	0.045	-1.071	-0.011
Health literacy	0.034	0.011	0.251	0.003	0.012	0.057
Reproductive health literacy	0.058	0.021	0.223	0.007	0.016	0.100
Constant	-0.330	1.534	-	0.830	-3.356	2.695

## Discussion

This study aimed to examine the relationship between fertility knowledge, general health literacy, and reproductive health literacy among young Iranian women. The mean level of fertility knowledge was moderate. There was a significant positive relationship between fertility knowledge and both general and reproductive health literacy, with each serving as a significant predictor of fertility knowledge. Furthermore, a strong correlation was observed between general health literacy and reproductive health literacy. In contrast, socioeconomic status showed a significant inverse relationship with fertility knowledge, while age demonstrated a positive, albeit marginally significant, association.

The average general health literacy score among the female students was 74.07, which falls within the "adequate" range. Several other studies have similarly assessed health literacy levels among Iranian students and women, with most findings aligning with the current study [24, 29-32]. International studies have also corroborated these results [33, 34]. However, Khajouei & Salehi report that only 29% of high school students possess adequate health literacy [35], a finding further supported by a systematic review [36], which contrasts with the present study. This discrepancy may stem from differences in the measurement tools used and the varying age groups of participants.

The mean fertility knowledge score was moderate, while the mean reproductive health literacy score was high. Similar results have been reported in previous research. For example, a study on married students at Mazandaran University of Medical Sciences reports adequate sexual health literacy [37], and another study found that reproductive health literacy among young Iranian couples (average age 32) is at a desirable level [23]. Jamali *et al.* also report that only 23.3% of Iranian women have limited health literacy [38], while Dehghankar *et al.* assess Iranian women's reproductive and sexual health literacy as favorable [39]. Other studies have shown that nearly half of women aged 18-49 possess adequate health literacy [40] and that fertility and sexual knowledge among men and women aged 15-49 in Tehran is at an acceptable level [41]. These findings are consistent with a study by Kohan *et al.*, which employed a similar measurement tool and reported that 91% of women in Isfahan have adequate reproductive health literacy [42]. Similar findings are also presented in the study by Panahi *et al.* [43]. Sayadi & Ahmadipour report high levels of reproductive health literacy among women in Chabahar [44], and a study in Amol found that only one-fourth of women have inadequate sexual health literacy [45]. Nonetheless, some studies have reported differing results. For instance, two studies in Iran found that more than half of the women have

moderate reproductive health literacy, with only 3.9% demonstrating adequate literacy. These differences may be attributed to sociocultural and economic variations in the studied populations [46, 47]. Additionally, a study of 400 young individuals attending a premarital counseling center in Bandar Abbas reveals suboptimal sexual and reproductive health literacy, possibly due to the use of a researcher-developed tool [48]. Some international studies support the current findings [49, 50]. However, a study conducted in Lao PDR among adolescents aged 15-19 reports that 65% have inadequate sexual and reproductive health literacy [16], likely influenced by the country's low level of economic development. This aligns with the present study's finding that economic status is a key determinant of sexual health literacy.

Spearman's rank correlation coefficients indicated significant positive correlations among fertility knowledge, general health literacy, and reproductive health literacy. This was further confirmed by linear regression analysis, which identified both general and reproductive health literacy as positive predictors of fertility knowledge. A significant positive correlation was also found between general health literacy and reproductive health literacy. These findings are consistent with previous research, suggesting that health literacy is closely linked to reproductive health knowledge and may influence various aspects of reproductive health [46, 51-54].

There was also a significant inverse relationship between economic status and fertility knowledge. This finding is consistent with research by Nematzadeh *et al.*, demonstrating that students with lower economic status are less likely to have adequate sexual health literacy [55]. Other studies have also confirmed the positive association between socioeconomic conditions and health literacy, including those by Sayadi & Ahmadipour [44], Abedian Kasgari *et al.* at Mazandaran University of Medical Sciences [37], and studies by Vakili *et al.* [56] and Small *et al.* [57]. This negative association may result from financial constraints that limit access to educational and informational resources related to reproductive and sexual health.

There was also a positive relationship between age and fertility knowledge, indicating that older participants possessed greater awareness of fertility-related issues. This is consistent with findings from Kohan *et al.* [42, 58], Sayadi & Ahmadipour [44], and other national [41] and international studies [59, 60]. In contrast, some studies have found that younger individuals exhibit higher levels of sexual health literacy [38, 61], which may be due to those studies' focus on adolescents. Increased Internet use among adolescents, targeted reproductive health education in schools, and sociocultural shifts associated with modernization in Iran may explain these divergent findings. In particular, generational differences in

attitudes toward sexuality—between those born in the 1960s and the 1990s—may have significantly influenced these trends [38].

While fertility knowledge among female university students was moderate, their general and reproductive health literacy levels were relatively favorable. A significant positive association was observed between health literacy and fertility knowledge, underscoring their crucial role in enhancing fertility awareness. Poor economic status was inversely associated with fertility knowledge, while age showed a marginally significant positive correlation. These findings highlight the importance of promoting health literacy, particularly among economically disadvantaged groups. Overall, strengthening formal and targeted reproductive health education for students appears essential.

One of the key strengths of this study is the use of stratified random sampling, which enhances the representativeness of the sample and reduces selection bias. However, the study also has several limitations. First, due to the cross-sectional design, causal relationships between variables cannot be established. Future research using longitudinal or interventional designs is recommended to address this limitation. Second, although validated tools were used, all data were collected through self-report, which may be subject to information bias. Incorporating observational or mixed-method data in future studies could enhance reliability. Third, most participants were medical students, which may limit the generalizability of the findings. Future studies should aim to include more diverse geographic and demographic samples.

## Conclusion

Fertility knowledge among female university students is moderate and significantly influenced by both general and reproductive health literacy.

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